WATER STEWARDSHIP PARTNERSHIP AND INITIATIVES - UMHLATHUZE

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IWaSP INTERNATIONAL WATER STEWARDSHIP PROGRAMME

UKaid from the British people

german cooperation DEUTSCHE ZUSAMMENARBEIT

Implemented by: giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

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INTRODUCTION

- Non-Revenue Master Plan 2011/12
- Non-revenue Master Plan 2016/17
- Water Services Development Plan
- Bulk Water Master Plan
- MuSSA feedback Report 2017
- Integrated Development Plan 2017-2022
- Water conservation and demand management unit: non-revenue water reduction program – Close out report phase 2
- Umhlahuze Data Loggers 2018
- DWS, No-Drop water balance

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POPULATION

- 334 459 – Non-revenue master plan 11/12
- 410 465 - Water Services Development Plan 2017
- 342 239 – Water Balance 2018

58% in tribal areas

2011 Census

3.95 persons per household

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INFRASTRUCTURE

- 77 363 – Households access to safe drinking water (Master plan)
- 101 289 – Households Services (103 915 community survey 2016)
- 108 503 – Access to water (* 3,95 = 428 586 population)
- 50 835 - Free basic Water ?

These figures do not line-up with the most recent Water Balance and this can be attributed to the consumer count staying the same and lack of information around the informal villages. The official method is to accept the last CENSUS result as the standing amounts, unfortunately this lead to misleading results. The Water balance indicate a large increase in input volume but the consumer count stay the same. It is proposed that one data base be approved to be used in all departments and if updated that it be done through all departments.

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SERVICE IMPROVEMENT PLAN

- Basic services to rural communities - A package of basic services such as water (water tanks), waste removal skips, rehabilitation of municipal gravel roads and electricity (100% coverage of municipal licenced area) is accessed by all rural within uMhlathuze.

- Low water pressure affecting households - Pipe replacement project currently underway to improve water pressure management and replace old pipes.

- Water supply to rural areas including water tanks (measuring consumption for water balance)

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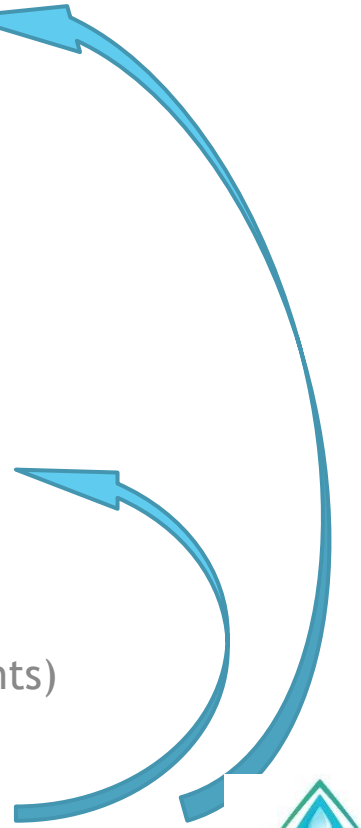
MuSSA

- Staff Complement
  - 50% technical staff (75% qualified)
  - 50% resource availability, include contractors
- Water Resource management
  - Quality
  - Availability
- Financial
  - Budget above 50%
  - Spending below 50%

Vehicle to implement

- Asset management
  - 75% data base accuracy (problem highlighted in all documents)
  - Staff shortages (Technical skills of maintenance staff)
  - Water use in rural areas



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WATER BALANCE

- 11/12 Non-revenue master Plan
  - NRW – 30%
  - IFU - 20%

  Projected for 2016/17

- 16/17 Non-revenue mater Plan
  - NRW – 42,3%
  - IFU - 27,6%

- Non-revenue Project (end 2017)
  - NRW - 39,4%
  - IFU - 19,5%

- No-Drop
  - NRW – 23%

  10 Months

The optimal scenario i.e. the minimum practical achievable NRW by Volume for the entire COU area of supply has been established as **33.4%** of the SIV - it will become prohibitively expensive and require a disproportionate amount of time, resources and budget to achieve any better target than this in the next 5-years.

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WATER BALANCE

City of Umhlathuze No-Drop water balance analysis					
Period: Jul-17 to April 18			10 Months		
	Richards Bay	Empangeni	Esikhaleni	Ngwelezane	Total Umhlathuze
Population served	139 752	60 526	87 476	54 485	342 239
Population growth	0,0%	0,0%	0,0%	0,0%	0,00%
Households served	23 292	10 088	14 579	9 081	57 040
Household growth	0,0%	0,0%	0,0%	0,0%	0,00%
System Input Volume - April 18	15 076 265	7 950 462	10 215 921	3 228 913	36 471 561
% Growth/ Decline (over 10 months)	19%	10%	2%	12%	11,1%
Authorized Consumption - April 18	134 365	6 597 554	8 566 788	2 475 684	31 076 528
% Growth/ Decline (over 10 months)	17%	11%	22%	10%	16,5%
Unbilled Autherized - April 18	10 616	799 904	1 078 686	125 792	3 065 981
% Growth/ Decline (over 10 months)	87%	1495%	57%	60%	121%
Water Losses - April 18	1 639 753	1 352 908	1 649 143	753 229	5 395 033
% Growth/ Decline (over 10 months)	47%	2%	46%	16%	12%
Non-Revenue % - April 18	17,9%	27%	27%	27%	23%
% Growth/ Decline (over 10 months)	34%	43%	28%	8%	1%

The optimal scenario i.e. the minimum practical achievable NRW by Volume for the entire COU area of supply has been established as **33.4%** of the SIV - it will become prohibitively expensive and require a disproportionate amount of time, resources and budget to achieve any better target than this in the next 5-years.

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CHALLENGES

CHALLENGE	IMPLEMENTED	PROPOSED
SIV – data credibility • Bulk metering + WTP info	• Bulk meter replacement and serviced • Monitoring system	Continuous monitoring and maintenance
Infrastructure data (pipe & meters) Records of repairs	• Leak repair program • Stand pipe survey	• Remove redundant inf. • Leak detection program • Complaint management program
Meter reading data base: • Number of connections not included (200%) • Credibility of readings • Unbilled authorized consumption	• Billing vs GIS data base clean-up found 28% errors. • Top 60 consumer meters audited and replaced. • 50.7% completion on ILR • Flow restrictors 18 000 installed. • Community awareness program	• Update and clean data base • Meter replacement program • Continue ILR program • Continue low restrictor program • Smart water meters

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CHALLENGES

CHALLENGE	IMPLEMENTED	PROPOSED
• Limited data on Individual supply system • Knowledge limited to individuals • Pressure monitoring	• Monitoring system installed • 22 new pressure zones designed	• Continuous Monitoring and maintenance • Implement new pressure zones • Internal information share
Rural Areas pressure management and maintenance knowledge.	• New pressure zones • Skills transfer	• Analyse rural networks • Implement new pressure zones • Skills transfer
Management by-in NRW • Budget • Resources	• Draft illegal connection policy • Training and mentorship	• Approve policy and implement • Workshop with Management (Score board) • Indigent register update
• GIS system capacity	• GIS info on project items submitted	• Network analysis and GIS system update be done

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CHALLENGES

CHALLENGE	IMPLEMENTED	PROPOSED
Water loss management capacity constraints • Resources	• Meter maintenance schedule developed	• Routine maintenance contract • Leak repairs contract • Replacement contract

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PROJECT INITIATIVES

STATUS QUO/ GAPS ANALYSIS REPORT

A comprehensive status quo/ gaps analysis report was compiled looking at:

- Current water balance
- Current water supply monitoring
- Water Conservation planning
- Challenges

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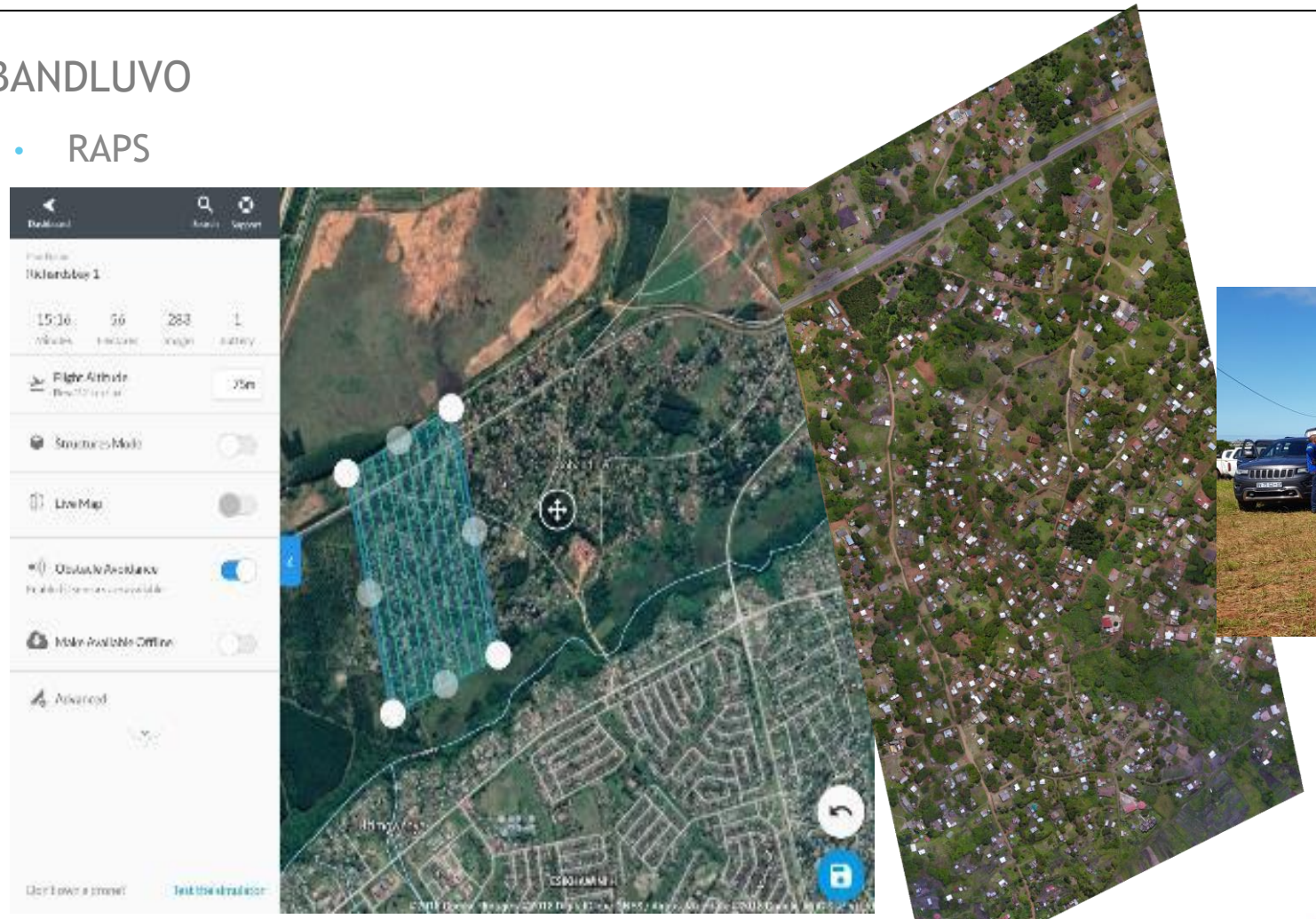
PROJECT INITIATIVES

GOBANDLUVO

- RAPS



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PROJECT INITIATIVES

GOBANDLUVO

- RAPS

AREA 5

Households
44+66+73+67+110+39=399
- 3.95 people @ household = 1576

Rooms
4+2+4+3+1+3=17 Buildings
- 5 rooms @ building = 85
- 3 people @ room = 255

Total People = 1831

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PROJECT INITIATIVES

GOBANDLUVO

- Population

GOBANDLOVU HOUSE COUNT						Oct-18		
Area	Households		Rooms		School	Population	Households 70%	
	Number	People	Number	People			Number	People
Area 1 (Far West)	1048	4140	155	465	0	4605	842,1	3223
Area 2 (Centre West)	855	3377	155	465	2	3842	707	2690
Area 3 (Centre)	636	2512	60	180	0	2692	487,2	1885
Area 4 (Centre East)	478	1888	85	255	0	2143	394,1	1500
Area 5 (Far East)	399	1576	85	255	0	1831	338,8	1282
Totals	3416	13493	540	1620	2	15113	2769,2	10579
Sensus 2011	1299	5271				5271		
Growth	262,97%	255,99%				286,72%		

PROJECT INITIATIVES

GOBANDLUVO

- Water Demand

Description	Duration	ML	Kl	Month	Day	L	Unit
Field Measured consumption figures SENSUS demarcation 2018	Monthly	41,7221	41722,1	3,501013	0,1167	**116,70**	Per Person
	Daily low	0,8779	877,9		0,073667	73,67	
	Daily High	1,3836	1383,6		0,116102	116,10	
	Yearly Month Ave	37,892108	37892,11	3,179628	0,105988	105,99	
				12,55953	0,418651	418,65	Per Household
Field Measured consumption figures SENSUS 2011	Monthly	41,722	41722	7,915386	0,263846	**263,85**	Per Person
	Daily low	0,8779	877,9		0,166553	166,55	
	Daily High	1,3836	1383,6		0,262493	262,49	
	Yearly Month Ave	454,7053	37892,11	7,188789	0,239626	239,63	
				29,17021	0,97234	972,34	Per Household

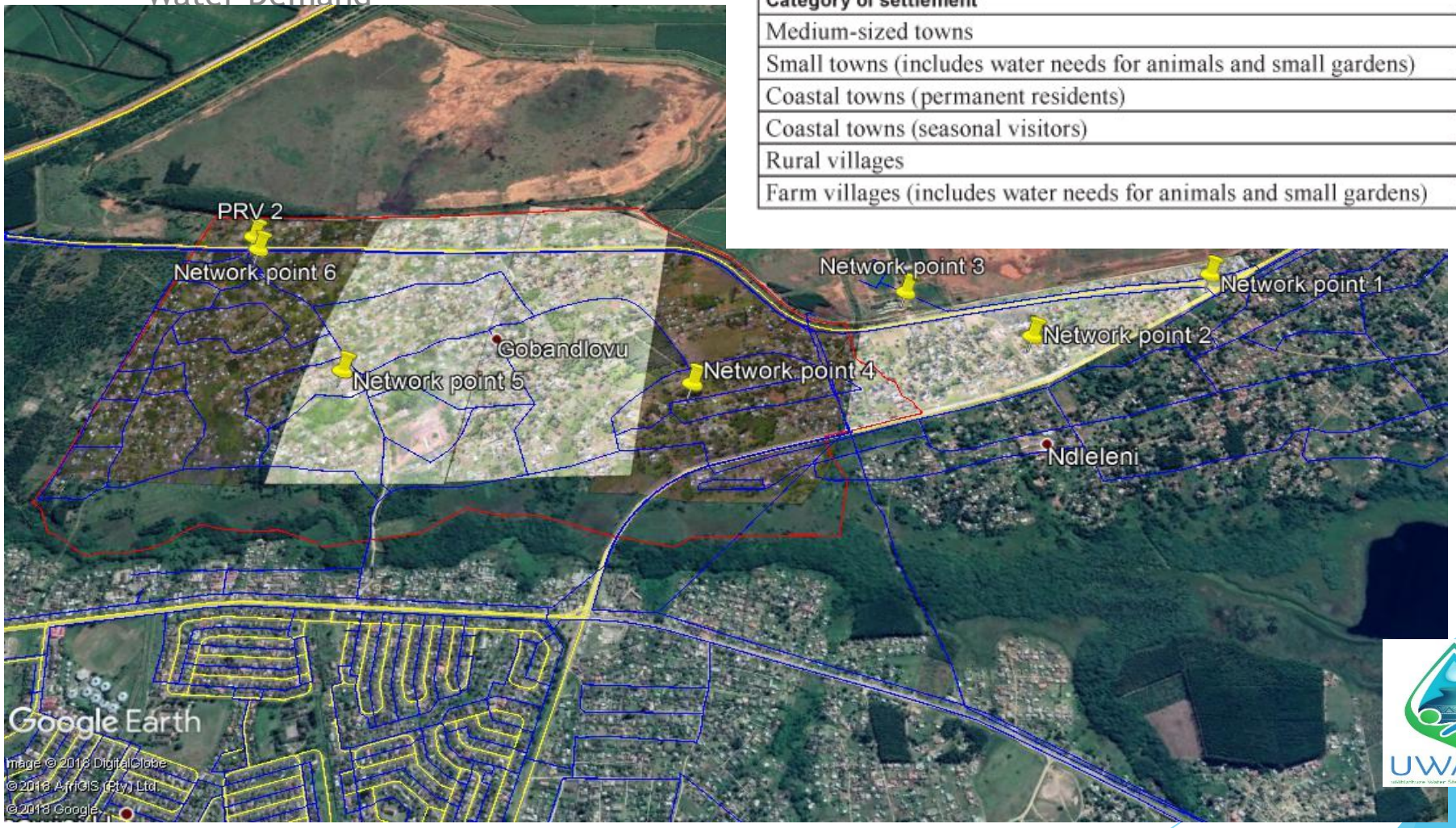
PROJECT INITIATIVES

GOBANDLUVO

- Water Demand

Table 1
Average per capita water requirements for different categories of settlements

Category of settlement	ℓ/d per capita
Medium-sized towns	150 - 200
Small towns (includes water needs for animals and small gardens)	200 - 250
Coastal towns (permanent residents)	200 - 250
Coastal towns (seasonal visitors)	80 - 130
Rural villages	60 - 100
Farm villages (includes water needs for animals and small gardens)	100 - 150



PROJECT INITIATIVES

GOBANDLUVO

- Water Demand

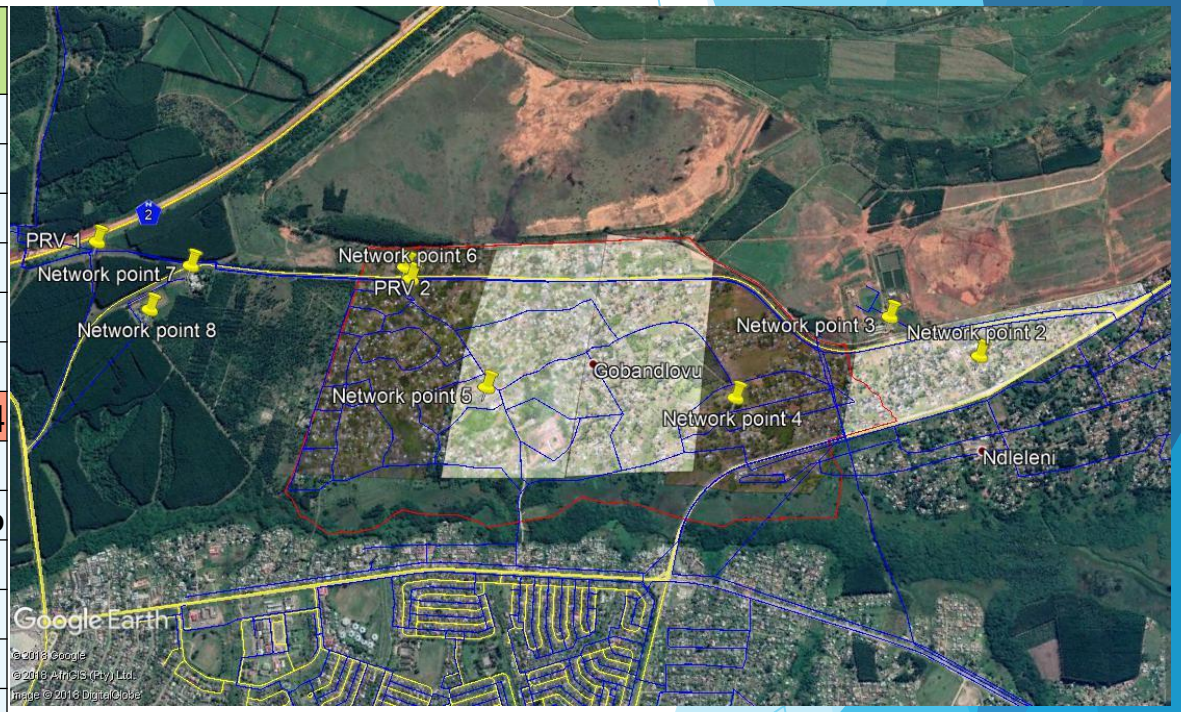
GOBANDLOVU WATER DEMAND							
Description	**Duration**	**ML**	**Kl**	**Month**	**Day**	**L**	**Unit**
Field Measured consumption figures 100%	Monthly	41,7221	41722,1	2,76064	0,092021	92,02	Per Person
	Daily low	0,8779	877,9		0,058088	58,00	
	Daily High	1,3836	1383,6		0,091549	91,55	
	Yearly Month Ave	37,892108	37892,11	2,507219	0,083574	83,57	
				11,25062	0,375021	375,02	Per Household
Field Measured consumption figures 70% permanent	Monthly	41,722	41722	3,943762	0,131459	131,46	Per Person
	Daily low	0,8779	877,9		0,082983	82,98	
	Daily High	1,3836	1383,6		0,130784	130,78	
	Yearly Month Ave	37,892108	37892,11	3,581742	0,119391	119,39	
				13,68341	0,456114	456,11	Per Household

PROJECT INITIATIVES

GOBANDLUVO

- Hydraulic layout

Altitude	Point	Pressure	Pressure	Pressure	Height Diff	Height diff
73	PRV 1		2,9 Bar			
70						
60						
55	PRV 2	1 Bar				
53	P6	1 Bar				
50						
47,6	P7			0,25 Bar	7,4	25,4
47,5	P4	1 Bar			7,5	
47,4	P1		3,2 Bar			25,6
45						
42,5						
41	P5	2 Bar			14	
40						
39,4	P8			0,6 Bar	15,6	33,6
38,5	P2	0,5 Bar			No network	
35						
32,5						
30	P3		1,45 Bar			43



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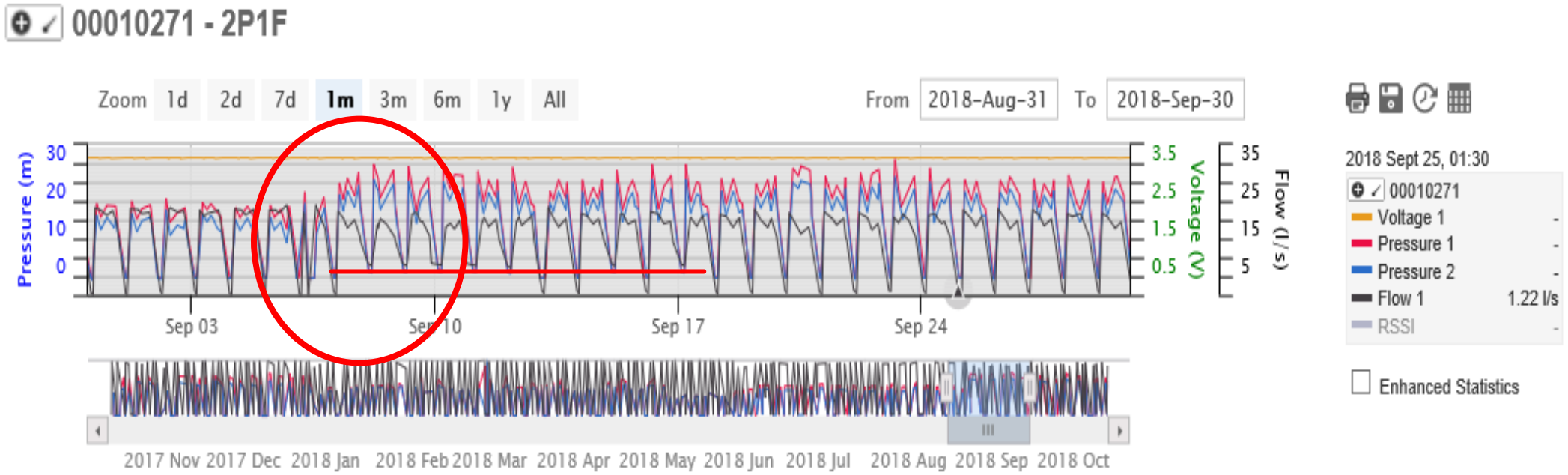
PROJECT INITIATIVES

GOBANDLUVO

- Network Pressures (PRV1)



Time range selected: 2018 Aug 31, 00:00 through 2018 Sept 30, 00:00

Device	Measurement	Min Occurred	Max Occurred	Minimum	Maximum	Range	Mean (l/s)	Volume (Ml)
00010271	Flow 1 (l/s)	2018 Aug 31, 03:30	2018 Sept 06, 13:30	0.00	23.89	23.89	14.81	38.398
00010271	Pressure 1 (m)	2018 Aug 31, 02:45	2018 Sept 23, 05:45	-0.69	30.98	31.67		
00010271	Pressure 2 (m)	2018 Aug 31, 02:45	2018 Sept 23, 05:45	-0.92	26.41	27.33		

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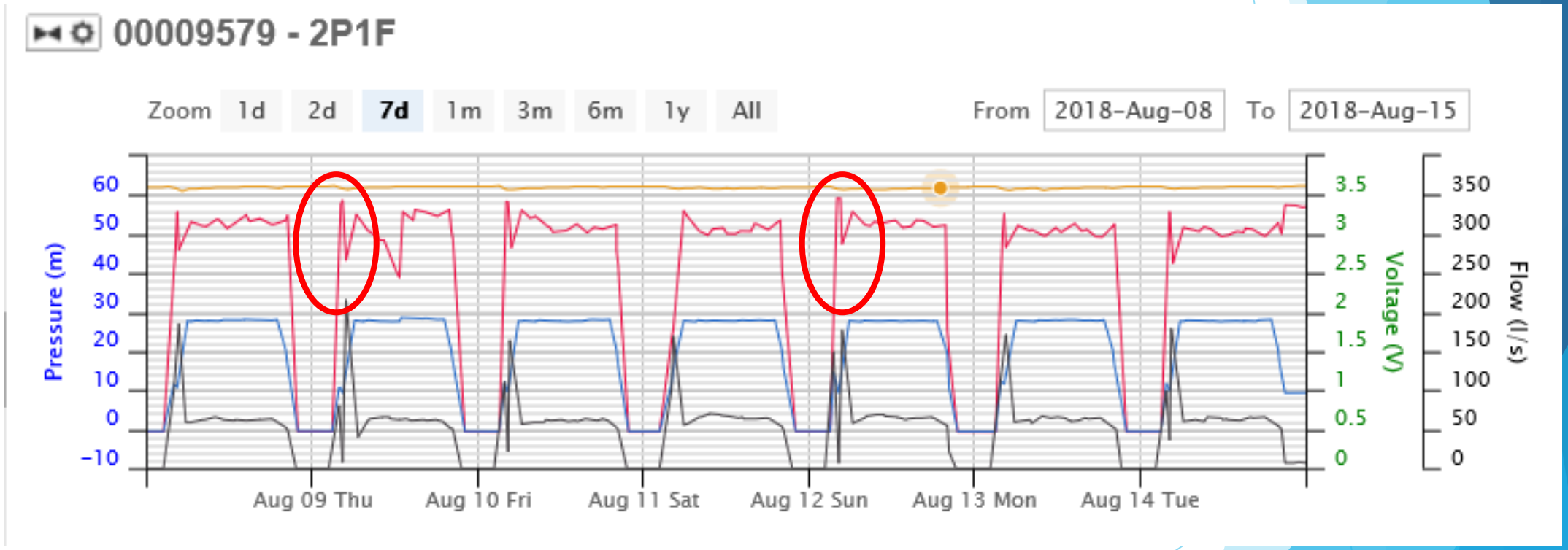
PROJECT INITIATIVES

GOBANDLUVO

- Network Pressures (PRV2)



PROJECT INITIATIVES

GOBANDLUVO

- Network Pressures (PRV 1 & PRV2)

IMPLEMENTABLE PROJECTS

WATER BALANCE

- Interdepartmental cooperation – meeting monthly
- Management Buy in – information share meeting yearly
- Standardize population and household figures – develop one data base
- Measure and reduce Unbilled Authorized consumption by measuring the water supply to unmetered areas and traditional areas.

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IMPLEMENTABLE PROJECTS

WATER DEMAND

- Traditional areas investigation to determine the number of households - Gobandluvo

  Hydraulic analysis

  Pressure tests

  Mapping with RPAS (Remotely piloted aircraft system)

- Spatial mapping of existing services using students

  Gobandluvo

  Vulindlela

  Matshawa

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IMPLEMENTABLE PROJECTS

SERVICE DELIVERY

- Comprehensive Complaints Management Program – Automated monthly information share
- Pressure control maintenance – establish a specialist team responsible for routine maintenance, repairs and adjustments. (from networks)
- As and When required contractors to assist with technical skills shortages and network repairs to alleviate personnel shortages.
- Skills transfers – include specific time frames into contracts to allow for contact time between consultants, specialised contractors and Umhlathuze staff

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IMPLEMENTABLE PROJECTS

WATER LOSE REDUCTION

- Water supply restrictor washers – continue with existing roll-out, focus should be placed on unbilled areas.
- Investigate the installation of smart water meters – Smart meter specialists must be invited to resent available solutions.
- An active leak detection program must be sustained using all tools and information currently available.
- Reduced turnaround times - As and when contracts to alleviate personnel shortages

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IMPLEMENTABLE PROJECTS

BUDGET

- Update indigent register – equitable share supplement to operational budget.
- Smart water meters – Water supply control, accurate billing and pre-paid water system.
- Water meter audit and replacement program – Focus on High volume water users.
- Update and clean-up of financial data base – Ensure all water meters are registered, check that all stands are on system. Resolve problem accounts

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PRIORITIZED IMPLEMENTABLE PROJECTS

- Replication of household counts.
  - Vulindlela
  - Matshawa
- Address shortage of personnel
  - additional water demand field and office technicians
  - DWS graduate program
- Awareness raising campaign with communities.

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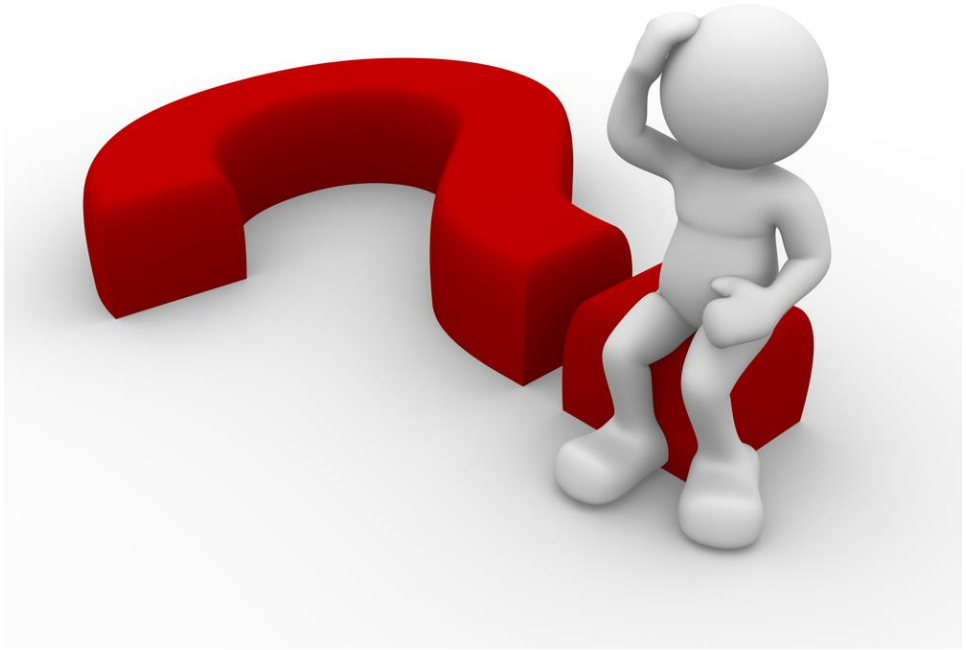

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Thank You